

L 39491-65 EWT(1)/EPF(c)/EPF(n)-2/ENG(n)/EPR Pr-4/Ps-4/Ps-4 WW
 UR/0096/64/000/011/0039/0044
 ACCESSION NR: AP5011719

AUTHOR: Karsina, E. S. (Candidate of technical sciences); Karpov, V. V. (Engineer); Martynov, A. V. (Engineer); Mints, M. S. (Engineer)

TITLE: Investigation of heat exchange in the burner and superheaters during consumption of mazut

SOURCE: Teploenergetika, no. 11, 1964, 39-44

TOPIC TAGS: thermoelectric power, thermoelectric power plant, steam boiler, steam superheater, heat transfer, combustion chamber, combustion

ABSTRACT: The results are presented of an investigation of heat exchange in the combustion chamber of TP-170-1 and BKZ-210-140F boilers during combustion of sulfurious Bashker mazut [petroleum residue]. The test data on the total heat exchange with $\alpha_p \gg 1.1$ are described well by computed recommendations (Gurvich, A. M., Karsina, E. S., Mitor, V. V., Informatsionnoye pis'mo VTI and TsKTI, 1961). Use of sprayers of various constructions, and also the conversion of three stages of burners into two and into one with a simultaneous increase of the productiveness of the sprayers does not exert an influence on the total heat exchange. During

Card 1/2

L 39491-65

ACCESSION NR: AP5011719

a reduction of the surplus air to below 1.1 and to 1.04, the temperature of gases at the output of the combustion chamber of the BKZ-210-140F boiler exceeded that computed at approximately 100° C, which was caused by persistence of the combustion. The variation factor of the upper third of the burner of the BKZ-210-140F boiler amounted to $y = 0.7$. The maximum incident heat flow in the burner of the BKZ-210-140F boiler is distributed in the region of the sprayers on the side walls and at just the same level in the center of the front wall, and amounts to 470 kilowatt/m². The average values of the coefficients of clogging for the superheaters are as follows: screen superheater -- $\xi = 0.013 \text{ m}^2 \cdot \text{degree/watt}$; second (hot) stage of the convective superheater $\xi = 0.011 \text{ m}^2 \cdot \text{degree/watt}$; first (cold) stage of the convective superheater $\xi = 0.017 \text{ m}^2 \cdot \text{degree/watt}$. Such high values of the coefficients of clogging indicate the necessity for cleaning the superheaters during consumption of mazut. Orig.art.has:3 tables, 6 graphs.

ASSOCIATION: VTI; HASHERNERGO

SUBMITTED: 00

NO REF SOV: 005

ENCL: 00

OTHER: 000

SUB CODE: TD, EE

JPRS

cons 2/2

MINTS, M., inzhener.

Suspension panels for supporting partitions. Streits: 2 no. 11:21
N 156. (MIRA 10:1)

(Concrete slabs)

97 - 1 - 6/10

AUTHOR: Mints, M.S., Engineer

TITLE: Large Concrete and Reinforced Concrete Suspended Load Bearing Partitions. (Kрупнопанельные несущие подвесные перегородки из бетона и железобетона.)

PERIODICAL: Beton i zhelezobeton, 1957, No. 1, pp 23-25, (U.S.S.R.)

ABSTRACT: Suspended panels have been tested in the Institute of Building Technique of the Academy of Building and Architecture of the USSR (Institut stroitel'noy tekhniki akademii stroitel'stva i arkhitektury SSSR). These panels were designed by M.S. Mints and N.V. Morozov. They have 2 top consoles which rest on load-bearing walls. These partitions are reinforced so that the width above the door opening constitutes a beam in the width of the partition. Another arrangement of the reinforcement, forms ties which transmit the load to or near the supporting upper consoles. The construction of consoles along the top in preference to forming the same at a lower level is more advantageous for structural reasons and results in thinner partitions. The partition panel is actually suspended from the beam like an apron and there is

Card 1/3

97 - 1 - 6/10

TITLE: Large Concrete and Reinforced Concrete Suspended Load Bearing Partitions. (Krypnopanel'nye nesushchiye podvesnyye peregorodki iz betona i zhelezobetona.)

no need to pay special attention to verticality. These partitions can be made from lightweight or ordinary concrete Brand 100 - 200. Only slight modifications in the reinforcement are necessary if the panel contains a door opening. In this case the tie is anchored further away from the console end. A further method of reinforcing partition panels which contain door openings consists in having top beams at the floor slab level which is wider than the panel and which forms a top flange from which the reinforcement of a continuous or partial panel beam is suspended. The last method allows for more door openings to be formed in any position but its disadvantage lies in the high proportion of reinforcement. Steel of $R_a = 2.400 - 3.400 \text{ kg/cm}^2$ is used. Savings could be achieved by using prestressed reinforcement. Partitions between rooms of the same flat should possess a sound insulation of 40 decibels; partitions between individual flats should have a sound insulating capacity of 48 decibels. The weight of one square meter of partition should not be less than 100kg to reach the above values. This is achieved when the weight of the concrete ranges from 1.700 - 1.800 kg/cm^3 . Partitions designed in this way are 6 cm thick. Flat-

Card 2/3

97 - 1 - 6/10

TITLE: Large Concrete and Reinforced Concrete Suspended Load Bearing
Partitions. (Kрупнопанельные несущие подвесные перегородки
из бетона и железобетона.)

dividing partitions are doubled with 5 - 8cm air space between them,
the sound insulation reaching 50 - 52 decibels.

There are 4 diagrams, 1 table.

ASSOCIATION:

PRESENTED BY:

SUBMITTED:

AVAILABLE: Library of Congress

Card 3/3

MUMTS..M.S. inzh.; FEDOROV, E.M., inzh.

Results of the competition for standard plans for an apartment house and a prefabricated-house factory. Biul. stroit. tekhn. 15 no.3:1-9 Mr '58. (MIRA 11:3)

1. Institut zhilishcha Akademii stroitel'stva i arkhitektury SSSR.
(Architecture--Competitions) (Apartment houses)

MINTS, M., inzh.

Erecting houses with materials taken directly from trucks in
Kaliningrad. Stroitel' no.4:3-5 Ap '59. (MIRA 12:c)
(Kaliningrad--Precast concrete construction)

MINTS, M.S.; APTERMAN, I.Z.; PASS, S.A.; FEDOROV, N.N.; LAZAREVICH, S.K.,
retsenzent; ARBUZOV, N.T., retsenzent; SAVEL'YEV, P.P., retsenzent;
ZAREMBA, B.V., inzh., nauchnyy red.; MORSKOY, K.L., red.izd-va;
RUDAKOVA, N.I., tekhn.red.

[Rating designs of large-panel apartment houses from the technical
and economic point of view] Tekhniko-ekonomicheskaya otsenka
konstruktivnykh reshenii krupnopanel'nykh zhilykh zdaniy. Moskva,
Gos.izd-vo lit-ry po stroit., arkhitekt. i stroit.materialam, 1961.
117 p. (MIRA 14:6)

(Apartment houses)
(Precast concrete construction)

MINTS, M.S., inzh.

A method for choosing the most efficient design details for
large-panel apartment houses. Izv. ASIA no.2:71-88 '61. (MIRA 15:1,
(Apartment houses)

MINTS, M., inzh.

Waterproofing unit operating on a gas flame. Stroite''.
no.7:25-26 J1 '61. (MIRA 14:8)
(Waterproofing—Equipment and supplies)

KARASINA, E.S., kand. tekhn. nauk; KROFI, L.I., kand. tekhn. nauk;
ABPYUTIN, A.A., inzh.; MINES, M.S., inzh.

Use of a heat probe in the study of the heat exchange of furnaces
and steam boilers. Teplotenergetika 12 no.2:69-72 1965.

(MIRA 18:3)

1. Vsesoyuznyy teplotekhnicheskiy institut.

MEINER, M. "M.: Master Plan-Mat. Cat. (Map) -- "Some problems in the ... of the ...". New York, 1958. ... (New York State ... V. V. ...),
100 copies (KL, No 11, 1958, 1959)

AUTHOR: PARGAMANIK, L.D., MIETS, N.Ya. 57-6-23/36
TITLE: Contribution to the Diffusion Theory of the Magnetron (Static State). (K diffuzionnoy teorii magnetrona (staticheskiy rezhim), Russian).
PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 6, pp 1301 - 1305 (U.S.S.R.)
ABSTRACT: It is assumed that the temperature in the entire volume is constant and that the relaxation of the electron gas is determined by the diffusion coefficient $D = kb$, where b is the mobility of the electron. A long cylindrical magnetron with a full anode, radius r_a and a thin cathode, radius $r_k \ll r_a$, is investigated on the axis. The potential gradient between the electrodes is ϕ and the voltage of the magnetic field is H . The motion of the electrons is expressed by the equation for the diffusion of the electron gas in the exterior field. The influence exercised by the magnetic field is disregarded. In the diffusion theory the density of the electrons is connected with the potential not locally (like in the case of the statistical theory), but integrally. The boundary conditions of the diffusion flow are obtained on the assumption that a reflection of the electrons impinging on the electrodes does not take place. The equation for

Card 1/2

Contribution to the Diffusion Theory
of the Magnetron (Static State).

57-6-23/36

the static state of the magnetron is derived and its characteristics are determined. The unknown function contained therein is determined from the Poisson equation. As the solution of the here derived integral-differential equation is very difficult, an approximated solution is deemed sufficient. The dependence of temperature and current on the magnetic field for the static state of the magnetron is found. According to the formula obtained temperature can be computed on the basis of the test characteristics. In conclusion, the results of the diffusion theory for the static state of the magnetron are compared with those of the statistical theory, and essential differences found. (With 1 illustration and 3 bibliographic references).

ASSOCIATION: Not given

PRESENTED BY:

SUBMITTED: 5/7/1956

AVAILABLE: Library of Congress

Card 2/2

MINTS, M. YA.
 AUTHOR: MINTS, M. YA. 57-6-24/36
 TITLE: On the Theory of a Magnetron with a Solid Anode. (K teorii magnetrona so sploshnym anodom, Russian,
 PERIODICAL: Zhurnal Tekhn.Fiz. 1957, Vol 27, Nr 6, pp 1306-1312 (U.S.S.R.)

ABSTRACT: The following assumptions are made:
 1.) The oscillation amplitude is sufficiently small,
 2.) The static state is described by the diffusion theory,
 3.) The decrement of dying down is smaller than the frequency of oscillations,
 4.) The variable components of the magnetic field are neglected.

Main attention is paid to computing impedance, which is the most important characteristic with the help of which the conditions for the excitation can be determined. It is shown that in the case of minor oscillations the amount of impedance is essentially determined by the frequency ω of the excited oscillations. Those ω -values were found at which the material part of impedance is negative and therefore excitation is possible. It is further shown that in dependence on the decrement amount of dying down δ there are two possibilities: either the two

Card 1/2

On the Theory of a Magnetron with a Solid Anode.

57-6-24/36

slight changes of frequency do not change the sign of the impedance and the excitation band is broad, or the slight changes of frequency lead to a change of the sign of impedance, and the domain of excitation consists of a large number of narrow bands closely adjoining one another. (With 1 Illustration and 1 Slavic Reference).

ASSOCIATION: Pedagogical Institute of Novosibirsk. (Novosibirskiy pedagogicheskiy institut)
PRESENTED BY:
SUBMITTED: 29.12.1956
AVAILABLE: Library of Congress

Card 2/2

MINTS *M Ya*
 AUTHOR: MINTS, M. Ya. 57-6-25/36
 TITLE: On the Theory of the Magnetron with a Split Anode. (K teorii magnetrona s razreznym anodom, Russian)
 PERIODICAL: Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 6, pp 1313 - 1318 (U.S.S.R.)

ABSTRACT: The following assumptions are made:
 1) The oscillation amplitude is sufficiently small, 2) the static state is described by the diffusion theory, 3) the decrement of dying down is smaller than the oscillation frequency, 4) the variable components of the magnetic field are neglected. - It is shown that in contrast to the impedance of a magnetron with an unsplit anode, its size in the case of a split anode depends not only on the frequency ω of the excited oscillations, but also on the ratio between the anode radius and the cathode radius $\zeta = \frac{r_a}{r_k}$. It is shown that with a given frequency ω a generation is possible only for those quantities of ζ , which do not exceed a certain maximum ζ_{\max} . With an increase of the number of segments the quantity ζ_{\max} becomes smaller. In the case of certain frequencies generation is entirely impossible (with any ζ).

Card 1/2

57-6-25/36

On the Theory of the Magnetron with a Split Anode.

It is shown that, like in the case of an unsplit anode, also in this case the excitation bands may be divided into a large number of narrow closely adjoining bands in the case of an unsplit anode. (With 2 Slavic references)

ASSOCIATION: Pedagogical Institute of Novosibirsk.
(Novosibirskiy pedagogicheskiy institut)

PRESENTED BY:

SUBMITTED: 29.12.1956

AVAILABLE: Library of Congress

Card 2/2

PA - 2700

AUTHOR: MINTS, M. YA.
 TITLE: On the Fluctuations of force in an Electron Gas. (O Fluktuatsiyakh sily v elektronnom gaze; Russian).
 PERIODICAL: Zhurnal Eksperim. i Teoret. Fiziki, 1957, Vol 32, Nr 2, pp 386 - 387 (U.S.S.R.)
 Received: 5 / 1957
 Reviewed: 6 / 1957

ABSTRACT: For the computation of the microscopical parameters of an electron gas it is important to know the distribution function $w(F)$ of an accidental force acting upon a separated electron. J. Holtmark, Ann.d.Phy s. 58, 577, (1919) obtained in his computations such a distribution function that all moments, from the second upwards, diverge. Correlation, on the other hand, will only take full effect at distances of $r_0 \sim e^2/KT$ (in which the average kinetic energy of the impinging particles has the order of magnitude of the potential threshold). In the case of $T \sim 10^5$, $r_0 \sim 10^{-8}$ applies. At great distances correlation is practically not perceptible, because the gas is assumed to be in the state of statistical equilibrium with constant density. The interaction of the impinging particles falling into a sphere with the radius r_0 can be neglected, because the relaxation length and the average distance between the particles are considerably larger than r_0 under the usual conditions. This means that the motion of the particles along the separated particle

Card 1/2

On the Fluctuations of Forces in an Electron Gas.

PA - 2700

is an ordinary Rutherford scattering. The distribution of the particles along the separated particle can be determined by the solution of this kinetic equation $\tau(\vec{r}) = \exp(-e^2/rkT)$. Also in the limiting case of very strong interaction the same expression for $\tau(r)$ is obtained. By means of the Markov procedure it can be shown that the function $w(\vec{F})$ decreases more quickly in the case of large \vec{F} than any power of F . Accordingly there are moments of all orders with $w(\vec{F})$. They can be computed by the developing the characteristic function in a power series. An accurate computation must take the correlation of the fluctuations of force in the different points of the space into account. The main contribution to mobility, to the cross-section, and to the relaxation length of the particles with wide interaction is furnished by the interaction with the fluctuations of the electric field. (Without illustrations)

ASSOCIATION: Not given.

PRESENTED BY:

SUBMITTED: 15.11.1956

AVAILABLE: Library of Congress.

Card 2/2

21178

S/141/60/003/000/017/02)
E192/E302

9.4210

AUTHORS: Tereshchenko, A.I. and Mints, M.Ya.

TITLE: Influence of Various Factors on the Magnitude of
Electron Frequency Shift in a Magnetron

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy,
Radiofizika, 1960, Vol. 3, No. 6, pp. 1054-1061

TEXT: The paper was read at the Scientific Technical
Conference GKRE in November, 1959.

Analysis of the equivalent circuit of a magnetron oscillator
shows that the relationship between the changes of the generated
frequency and the phase-shift angle for the high-frequency
component of the anode current and the high-frequency voltage
in the resonators is in the form (Refs. 1, 2):

$$f = f_0 (1 + \operatorname{tg} \varphi / 2Q_H) \quad (1)$$

where φ is the phase-shift angle between the high-frequency
component of the anode current and the high-
frequency voltage,

Card 1/7

21178

S/141/6C/003/006/017/025
E192/E382

Influence of

f is the generated frequency,
 f_0 is the frequency in the absence of phase-shift and
 Q_H is the quality factor of the oscillating system with load.

Eq. (1) shows that the frequency is primarily determined by mismatch angle ψ . For the determination of this angle it is possible to employ the theory suggested by Bychkov (Ref. 1). On the basis of this theory the mismatch angle ψ is expressed by:

$$\psi = \psi_1 + \psi_2 \quad (3)$$

$$\psi_1 = \arctg \left(K_1 \sqrt{f_0 \cos \psi_1} \right) \quad (4)$$

in which ψ_1 is the phase-shift angle between the induced current and voltage on the resonator and ψ_2 is the phase-shift between the tangential component of the induced

Card 2/7

21178

S/141/60/003/000/017/025
E192/E302

Influence of

current and the induced current itself. The angle is given by:

$$(1 + \operatorname{tg} 2\varphi_0) \cdot F_0(\varphi) = 2,275 R_2 \cdot I_0 \sin \varphi_0 \quad (5) \quad (3)$$

$$\alpha = \arctg \left\{ L_2 \cdot I_0 \cos \varphi_0 \right\} \quad (6) \quad (6)$$

where the function $F_0(\bar{\alpha})$ can be expressed by (Ref. 1).

$$F_0(\varphi) = [4 - 2,87 \cdot \frac{1}{2} \cdot (1 - \operatorname{tg}^2 \varphi) - 3,6 (e^{-\varphi} - e^{-2\varphi})] R_2 \quad (7) \quad (7)$$

A graph of this function was given in Ref. 1. I_0 in the above equations denotes the DC component of the anode current of the system. If the quantities $\alpha = L_2/R_2 \ll 1$,

$\gamma = K_2/R_2 \ll 1$ and $\sqrt{L_2^2 + R_2^2} \approx R_2$, the relationship between and $x = I_0 R_2^2$ can be simplified and written as

Card 3/7

21178

S/141/60/003/006/017/025
E192/E382

Influence of

$$\theta = \theta_0 - \gamma \sqrt{x} \cos \theta_0; \quad (17) \quad (17)$$

$$F_0(\bar{\alpha}) = -2.275 \sqrt{x} \sin \theta_0; \quad (18) \quad (18)$$

$$\bar{\alpha} = \arctg(\sigma \sqrt{x} \cos \theta_0) \quad (19) \quad (19)$$

For values of $\bar{\alpha}$ of less than 5° , Eq. (18) can be approximated by:

$$F_0(\bar{\alpha}) = 4 - 2.37 \sqrt[4]{\alpha} \quad (20)$$

In this case, the equations for $\bar{\alpha}$ and $F_0(\bar{\alpha})$ can be solved graphically and it is possible to determine a limiting value $x = x_1$ which corresponds to the minimum value of the anode currents $I_{01} = x_1 R_2^2$. It is then possible to obtain an analytical expression for x_1 and the corresponding

Card 4/7

Influence of

21178
S/141/60/003/000/017/025
L192/E302

angle θ_1 . From this the function $\tan \theta = f(x)$ in the vicinity of $x = x_1$ can be found and it is therefore possible to determine the frequency de-tuning in the vicinity of the minimum current I_{01} . It is shown that the de-tuning is expressed by:

$$\frac{\Delta f}{f_0} = \frac{f(I_0) - f(I_{01})}{f_0} \approx \frac{1}{2Q_0} \left(-\gamma \left[\frac{1}{x-1} - \frac{1}{\sqrt{x^2-1}} \right] + \lg \theta_1 \right) \quad (39)$$

A graph of this function is shown in Fig. 2. The coefficient of the electronic frequency de-tuning can be expressed by:

$$z_1(I_0) = \frac{df}{dI_0} = \frac{1}{I_0 Q_0} \left[\frac{1}{x-1} - \frac{1}{\sqrt{x^2-1}} \right] \quad (40)$$

Card 5/7

Influence of

21178
S/141/60/003/006/017/025
E192/E382

From this it is seen that at $x \approx 1/\gamma$, the current is equal to $I_{02} = (1/\gamma)R_2^2$. At this current the de-tuning coefficient is zero and consequently the maximum frequency stability is achieved. From the above, it is concluded that the maximum frequency de-tuning is obtained in the vicinity of the minimum current I_{01} , while the highest stability is obtained at the anode current I_{02} . Since the high-frequency output power is proportional to the anode current I_0 , it follows that the electron de-tuning curve (Fig. 2) represents also the dependence of power on frequency. There are 2 figures, 1 table and 2 Soviet references.

ASSOCIATION: Khar'kovskiy gosudarstvennyy universitet
(Khar'kov State University)

SUBMITTED: March 1, 1960

Card 6/7

L 33292-66 EWT(1)/T IJP(c) AT
ACC NR: AP6014056 SOURCE CODE: UR/0056/66/050/004/1156/1166

AUTHOR: Mints, M. Ya.

ORG: none

TITLE: Concerning the energy spectrum of a disordered linear chain

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 56, no. 4, 1966, 1156-1166

TOPIC TAGS: Schroedinger equation, atomic theory, energy band structure

ABSTRACT: A method is proposed for calculating the density of the energy states of a disordered linear chain. In this method the calculation of the state density $N(E)$ near its singular points reduces to solution of an ordinary differential equation of the Schroedinger type, to which the WKB method can be applied. In the case of a weakly disordered chain, near the point corresponding to the edge of the band of an ideal periodic chain, the asymptotic expression obtained for the energy-state density coincides with the corresponding expression obtained by F. J. Dyson (Phys. Rev. v. 92, 1331, 1953). The asymptotic expressions are obtained for specific types of chains (types I and II in Dyson's

Card 1/2

L 33299-66

ACC NR: AP6014056

2

definition). The results are also compared with those of I. M. Lifshits (ZhETF v. 44, 1723, 1963; UFN. v. 83, no. 4, 1963) and are found to agree with them, apart from a pre-exponential factor. The author thanks G. Ye. Zil'berman for continued interest in the work and useful discussions and I. M. Lifshits for useful discussions. Orig. art. has: 1 figure and 52 formulas.

SUB CODE: 20/ SUBM DATE: 23Nov65/ ORIG REF: 002/ OTH REF: 001

Card

2/2

ACC NR: A77002902 A SOURCE CODE: UR/0413/66/000/024/0041/0042

INVENTOR: Bushmin, M. Ye.; Smelyakov, V. V.; Mints, M. Ya.; Pungin, L. M.,
Tolstikov, V. F.

ORG: None

TITLE: A digital infrasonic phase-frequency meter. Class 21, No. 189485 [announced
by the Kharkov Higher Master Engineering Academy (Khar'kovskoye vyssheye komandno-
inzhenernoye uchilishche)]

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 24, 1966, 41-42

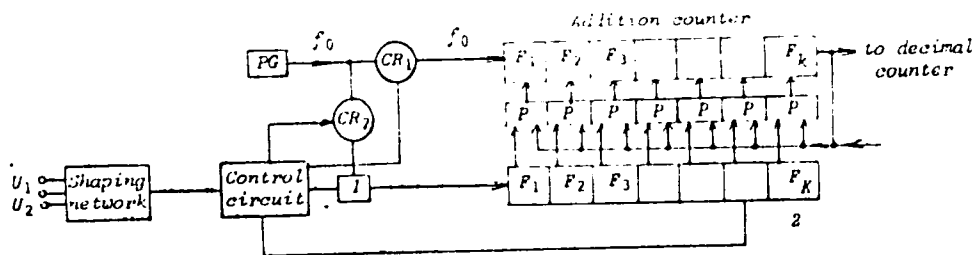
TOPIC TAGS: digital system, phase meter, frequency meter, logic element

ABSTRACT: This Author's Certificate introduces a digital infrasonic phase-frequency
meter with intermediate time-pulse conversion containing a standard generator with
output connected through controlled rectifiers to the inputs of addition and subtrac-
tion pulse counters, a shaping network and a registration unit. Measurement accuracy
is improved and speed is increased by using a frequency divider connected to the input
circuit of the subtraction counter in series with a controlled rectifier, together
with a control unit based on logical elements and a reversible counter. One of the
inputs of the control unit is connected to the shaping network, the other input is
connected to the subtraction counter and the outputs are connected to the controlled
rectifiers.

UDC: 621.317.761:621.317.772

Card 1/2

ACC NR: AP7002962



1—frequency divider; 2—subtraction counter

SUB CODE: 09/ SUEM DATE: 17Aug64

Card 2/2

MINTS, M. Z.

PHASE I BOOK EXPLOITATION SOV 7216

Sovetskaniye po elektrokimii. 4th, Moscow, 1956.

Trudy... [labornia] (Transactions of the Fourth Conference on Electrochemistry: Collection of Articles. Moscow, 1956. 250 copies printed. 1959. 868 p. Errata slip inserted. 2500 copies printed. Sponsoring Agency: Akademiya nauk SSSR. Otdeleniye khimicheskikh nauk.

Editorial Board: A.M. Prumkin (Resp. Ed.) Academician, S.A. Vesin, Professor, S.I. Zhdanov (Resp. Secretary), B.N. Kabanov, Professor, S.I. Zhdanov (Resp. Secretary), B.N. Kabanov, Professor, Ya. M. Kolotyrkin, Doctor of Chemical Sciences, V. Lasev, P. Lukovitskiy, Professor, Z.A. Solov'yeva, V. Stender, Professor, and O.M. Florianovich, Ed. of Publishing House: M.O. Yegorov, Tech. Ed.: T.A. Prusazova.

PURPOSE: This book is intended for chemical and electrical engineers, physicists, metallurgists and researchers interested in various aspects of electrochemistry.

COVERAGE: The book contains 127 of the 135 reports presented at the Fourth Conference on Electrochemistry sponsored by the Department of Chemical Sciences and the Institute of Physical Chemistry, Academy of Sciences, USSR. The collection pertains to different branches of electrochemical kinetics, double layer theories and galvanic processes in metal electrode-electrolyte systems. Abridged discussions are given at the end of each division. The majority of reports not included here have been published in periodical literature. No personalities are mentioned. References are given at the end of most of the articles.

A.A. Zhdanov, Chief Editor, Institute for the Study of the Influence of Aging Processes on the Electrochemistry of Alkaline Zinc Electrodes

Lukovitskiy, P.D. Theory of Processes Occurring at Zinc Electrodes of Chemical Sources of Current

Rozentveyl, S.A. and V.I. Lashin. Mechanism of the Anodic Oxidation of an Iron Electrode with Sea. Additions of Zinc Oxides

Balashova, N.A. V.A. Ivanov, and I.D. Kozlov. Institute of Electrochemistry, Academy of Sciences, USSR. Study of the Atoms to Study Processes in Chemical Sources of Current

Daniyel, Bek. V.S., M.Z. Mintz, V.V. Sviridov, and M.V. Zhdanov. Machinebuilding, Moscow, 1956. 250 copies printed. See also abstracts in the USSR Scientific Abstracts, Vol. 1, No. 1, 1956, p. 100. Ministry of Communications, USSR. Investigation of...

Card 11/14

Cells with Solid Electrolytes

Shchegoleva, A.A. A.M. An. Pustovoy, Institute of Physical Chemistry, Academy of Sciences, USSR. Study of the Electrochemistry of Solid Electrolytes

Leykin, E.I. Institute of Physical Chemistry, Academy of Sciences, USSR. Effect of Salt on the Anodic Oxidation of Zinc in a Solution of an Iron Electrode in an Aqueous Solution

Selezneva, P. and A. Zhdanov. Institute of Physical Chemistry, Academy of Sciences, USSR. Study of the Electrochemistry of Solid Electrolytes

Discussion (S.A. Zhdanov, N. Lashin, P. Lukovitskiy, A. Zhdanov, and contributing authors)

PART I. ELECTROLYTES IN THE ANODES OF ALKALINE BATTERIES

Card 12/14

Central Application of Hydrogen Element

After several years of intensive research, the results of the active element have been published. The results show that the active element has a high degree of stability and is suitable for use in a wide range of applications. The results also show that the active element has a high degree of stability and is suitable for use in a wide range of applications.

Page 1/2

MINTS, N.

Increase the supply of household goods.. Prom.koop. 13 no.2:10
F '59. (MIRA 12:4)

1. Zamestitel' nachal'nika planovogo otdela Roskhostorga.
(Household appliances)

MINTS O.Ya

BLAGMAN, G.F.; ESTRIN, Ye.I.; DVORKINA, Ye.B.; MINTS, O.Ya.

Determination of renal filtration with the aid of thiosulfate
and the maximum glomerular reabsorption of glucose. Klin.med.,
Moskva 29 no.5:59-67 May 1951. (CLML 20:9)

1. Of the First Therapeutic Clinic (Director--Honored Worker in
Science Prof. M.S. Vovsi, Active Member of the Academy Of Medical
Sciences USSR), Central Institute for the Advanced Training of
Physicians, Moscow.

that can be used in the laboratory

MINTS, R.I.

Distr: 482c

Formation of oxide (anti-corrosion) film on treatment of steel in molten salts and alkalis. A. V. Lopachy and B. I. Mintz. *Novye Metody Tekhnichesk. Obrabotki i Rasplavleniya*. Novaya Melody Tekhnichesk. Obrabotki i Rasplavleniya. 1955, 8-18; *Referat. Zhur. Met.* 1957, Abstr. No. 2759. During heat-treatment of articles made of steel, of the type 40KhS4, 38KhNM, 38KhN4M, etc., in baths consisting of the molten salts NaNO_2 , NaNO_3 , Na_2PO_4 , and NaOH , an oxide anti-corrosion layer forms on the surface of the metal. The bath compns. are given for use at various temps. (160-600°). For example, 40 NaOH + 30 NaNO_2 + 25 NaNO_3 + 5% Na_2PO_4 is used at temps. of 200-550°. The given bath can be applied either for isothermal treatment at temps. of 250-550°, or for low-temp. annealing. The oxide film has valuable properties and satisfies industrial requirements. The process of oxidizing the metal in molten alkalis depends on the phase compn. of the oxidizing metal and on the degree of decompos. of the supercooled austenite. Treatment in the described baths combines the advantage of bright tempering with the oxidizing operation and leads to significant economies by eliminating some operations. C. H. Fickman

11. A. 7 S, 1956, 39 p. 4,000

PHASE I BOOK EXPLOITATION

101

Mints, Rafail Issakovich

Novoye v termicheskoy obrabotke; sovmeshcheniye svetloy zakalki s oksidirovaniyem (A New Method of Heat Treatment; Combination of Bright Quenching and Oxidation) Moscow-Sverdlovsk, Mashgiz, 1956. 39 p. 4,000 copies printed.

Ed.: Bogachev, I. I., Professor, Doctor of Technical Sciences;
Chief Ed. of the Ural-Siberian MASHGIZ section: Kaletina, A.V.,
Engineer; Tech. Ed.: Dugina, N. A.

PURPOSE: The book is intended for engineering and technical personnel of machine-building plants.

COVERAGE: The brochure describes a new and effective method of treating steel parts. This method makes it possible to combine heat treatment with oxidation. The essence of this method lies in quenching parts in hot solutions. In this connection the brochure describes various methods of quenching in hot solutions and the properties the parts acquire by these methods. Quenching practices are

Card 1/2

A New Method of Heat Treatment; (Cont.) 101

employed by the following Soviet plants: "Frezer" plant, Chelyabinsk tractor plant, Kolomna plant imeni V.V. Kuybyshev, plant imeni Voroshilov, and "Krasnaya Etna" plant. There are 13 Soviet references.

TABLE OF
CONTENTS:

Introduction	3
Isothermal Treatment of Steel	5
Media for Isothermal Treatment of Steel	8
Quenching in Hot Media of Parts Made out of Instrument and Structural Steels	12
Combining Heat Treatment with Oxidation	22
Equipment for Treatment in Alkali Solutions	30
Economy of Combined Processing	38
Bibliography	40

AVAILABLE: Library of Congress (TS 320 .M64)

Card 2/2

VK/vs
7-17-58

S/123/59/000/01.123.1
A004/A001

The Combination of Heat Treatment and Oxide Coating in Molten Oxidizers

is 80% NaOH + 20% NaNO₃. In the melt composed of NaOH = NaNO₃ = NaNO₂ the oxide film does not acquire a higher corrosion resistance, but the melt consisting of three chemicals has a longer operation life than melts of only two chemicals. The anticorrosion properties of the obtained oxide films are determined by the first minutes of the oxidation process. The optimum duration of oxide coating at 400°C is 20-30 min, while at a temperature of 500°C it is 1-20 min. The optimum temperature ensuring an increase in the corrosion resistance of machine parts by 6.7 times is 400-500°C, while a treatment at 300°C results in an increase in corrosion resistance by 3.4 times. There are 4 figures and 9 references.

S.A.I.

Translator's note: This is the full translation of the original Russian abstract.

Card 2/2

SOV/137-58-9-19913

Translation from: Referativnyy zhurnal, Metallurgiy, 1958, Nr 9, p 260 (USSR)

AUTHORS: Bogachev, I.N., Mints, R.I.

TITLE: Effect of Alloying Upon the Cavitation Erosion Strength of Nodular Cast Iron (Vliyanie legirovaniya na kavitatsionno-erozionnuyu stoykost' chuguna s sharovidnym grafitom)

PERIODICAL: Izv. vyssh. uchebn. zavedeniy. Chernaya metallurgiya, 1958, Nr 2, pp 71-75

ABSTRACT: An erosion shock stand is used to study the cavitation erosion strength (CES) of unalloyed and alloyed nodular cast irons containing: a) 1% Ni and 0.28% Mo, b) 8.3% Ni, and c) 15.4% Ni. It is established that Ni-Mo iron quenched from 850°C has considerably higher CES than unalloyed iron. Ni irons (with 8.3 and 15.4% Ni) have the maximum CES and have a microstructure consisting of spicular products of austenite decomposition, but their CES is considerably lower than that of Ni-Mo iron.

E.Sh.

1. Cast iron--Erosion 2. Iron--Erosion 3. Metals
--Testing equipment

Card 1/1

AUTHORS: Bogachev, I. N., Mints, R. I. SV, 103-10-1-10, 10

TITLE: The Effect of the Chemical Composition and the Phase Composition on the Resistivity of Steels to Cavitation and Erosion (Vliyaniye khimicheskogo i fazovogo sostava na kavitatsionno-erozionnuyu stoykost' staley)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1965, Nr 3, pp 215 - 219 (USSR)

ABSTRACT: In the present paper the results obtained in the investigations of the effect of the chemical composition and the phase composition on the cavitation and erosion stability of steels are given. The effect of carbon on the erosion and cavitation stability shows that with an increase of the carbon content the erosion and cavitation stability of steel increases. A steel sample with 0.11 carbon has the highest stability in this respect. Steel samples of the same hardness and of different structure have a different stability. Also the other elements in steel effect this stability of steels. From the results obtained may be concluded that in the thermal

Card 1/2

The Effect of the Chemical Composition and the Phase Composition on the Resistivity of Steels to Cavitation and Erosion

treatment of structural steels a uniform structure is required to reach a practically uniform erosion and cavitation stability. There are 5 figures and 1 table.

ASSOCIATION: Ural'skiy politekhicheskii institut (Ural Polytechnical Institute)

SUBMITTED: October 21, 1967

Card 2/2

129-98-3-5/10
AUTHORS: Bogachev, I. N., Doctor of Technical Science, Professor;
and Mints, R. I., Engineer

TITLE: Role of the Grain in the Cavitation-Erosion Failure of
Steel (Rol' zerna v kavitatsionno-eroziionnoi
razrushenii stali)

PERIODICAL: Metallovedeniye i Obrabotka Metallov, 1979, No. 4
pp 26-29 (USSR)

ABSTRACT: Literature does not contain adequate information on the
influence of the grain size and grain boundaries on the
cavitation-erosion failure of steel. Therefore, in this
paper the influence is investigated of the size and the
character of the grain and also of its boundary on the
cavitation-erosion stability. The tests were carried out
on an impact-erosion test stand. The speed of rotation
of the specimens was 73 m/sec, the water pressure 0.23 atm,
the diameter of the outflow nozzle 3 mm, the distance
 $d = 1.4$ mm. The graph, Fig. 1, indicates that with
decreasing grain size the cavitation-erosion stability
of steel with a homogeneous structure (ferrite and
austenite) decreases. The cavitation-erosion stability
is greatest if the grain size is largest. According to

Card 1/3

129-58-3-5/16

Role of the Grain in the Cavitation-Erosion Failure of Steel

metallographic analysis, the cavitation-erosion failure of ferrite and martensite begins along the grain boundaries (Fig.2); with the progress of time the boundaries begin to fail completely and, following this, the grain breaks. Thus, the smaller the grain the larger will be the size of the boundaries and the lower will be the cavitation-erosion stability of the studied structures. The results on the influence of the grain size on the cavitation-erosion stability of heterogeneous structures (Steel 40, U8 and U12) are graphed in Fig.3. The influence of the character of the grain and the grain network on the cavitation-erosion stability of the steel U12 is graphed in Fig.6 and the influence of the speeds of cooling after tempering at 650°C on the cavitation-erosion stability of the steel 35KhGSA is graphed in Fig.7; the latter steel has a considerably lower cavitation-erosion stability in the brittle state than in the tough state. Thus, it can be concluded that the cavitation-erosion stability of steels depends on the size of the grain, the character of the grain boundaries and the body of the grain. The intensity of the failure

12-58-8-5/18

Role of the Grain in the Cavitation-Erosion Failure of Steel

is determined by a combination of the properties of the grain and its boundaries. The obtained results indicate that it is necessary to establish the relation between the cavitation-erosion stability of the steel and the properties which are associated with its fine structure. There are 7 figures and 5 references, all of which are Soviet.

ASSOCIATION: Ural'skiy politehnicheskii institut imeni Kirova
(Ural Polytechnical Institute imeni Kirov)

- 1 Grains (Metallurgy --Metallurgical effects 2. Steel--Erosion
- 3 Steel--Mechanical properties 4. Steel--Test methods

Card 3/3

BOGACHEV, I.N.; MINTS, R.I.

Investigating the oxidation process of steel in molten salts and
alkalies. Trudy Ural. politekh. inst. no.68:71-80 '58.

(MIRA 12:7)

(Steel--Hardening) (Oxidation)

SENKEVICH, V.F.; MINTS, R.I.; KRITSSTEYN, L.A.; KUROCHKINA, A.N.

Constitution and properties of certain structural steels hardened in
molten alkalies. Trudy Ural. politekh. inst. no.68:88-104 '58.

(MIRA 12:7)

(Steel--Hardening) (Steel, Structural--Testing)
(Metallography)

MINIS, R I

SOV/3486

3(7)

PHASE I BOOK EXPLOITATION

Bogachev, Ivan Nikolayevich, and Rafail Isaakovich Mints

Kavitatsionnoye razrusheniye zhelezouglerodistykh splavov (Cavitation Damage to Iron-Carbon Alloys) Moscow, Mashgiz, 1959. 109 p. 3,500 copies printed.

Reviewers: M. A. Aksel'rod, Engineer, and E. E. Blyum, Engineer; Ed.: E. L. Kolosova, Engineer; Tech. Ed.: N. A. Dugina; Exec. Ed. (Ural-Siberian Division, Mashgiz): A. V. Kaletina, Engineer.

PURPOSE: This book is intended for engineers and scientific workers studying the cavitation resistance of metals.

COVERAGE: This book is a study of the damage to iron-carbon alloys caused by cavitation. The book contains materials published as a result of a systematic study of cavitation metallography. It outlines efforts made to prevent cavitation of metal and analyzes the causes and mechanism of corrosion. Methods and equipment used for determining the cavitation resistance of alloys are described. Deformations caused by hydraulic shocks are analyzed, and comparisons of the cavitation resistance of iron, steel of different types, and other alloys are made. Problems of increasing the cavitation resistance of machine

Card 1/4

SOV/3485

Cavitation Damage (Cont.)

parts are discussed and a number of suggestions offered. Experiments were conducted with the help of Engineers N. V. Murnina, T. M. Petukhova, L. L. Slyusareva, and degree students D. Yemlevskaya, R. Korovina, G. Logina, N. Anfimova, R. Dovbenko, T. Vostrotina, and Sh. Verkhoglazov. There are 70 references: 54 Soviet, 10 English, 5 German, and 1 French.

TABLE OF CONTENTS:

Foreword	3
Introduction	5
Ch. I. Cavitation and Factors Influencing Its Development	7
Cavitation phenomenon	7
Concepts of the deterioration mechanism	14
Methods of investigating the cavitation resistance of alloys	22
Ch. II. Metallography of Cavitation Damage	30
Character of the cavitation effect on metals	30
Deterioration of mechanical mixtures	31
Deterioration of solid solutions	37

Card 2/4

SOV/3485

Cavitation Damage (Cont.)

Role of the grain and its boundaries	42
Characteristic features of cavitation damage	46
Ch. III. Cavitation Resistance of Constructional Steels	50
Pearlitic steel	50
Austenitic steel	62
Ch. IV. Deterioration of Gray Iron by Cavitation	70
Characteristic features of damage to cast iron by cavitation	70
Influence of the graphite shape	72
Influence of the matrix metal	74
Influence of heat treatment	75
Influence of alloying	79
Ch. V. Ways of Strengthening the Cavitation Resistance of Machine Parts	85
Choice of material resistant to cavitation	85
Elimination of vibration	92

Card 3/4

MINIS. 1

18(5) PHASE I BOOK EXPLOITATION 30V/2048
Sverdlovsk. Ural'skiy politekhnicheskii institut imeni S.M. Kirova
Teoriya i praktika litynogo proizvodstva (Theory and Practice in the
Foundry Industry) Moscow, Mashin. 1959. 231 p. and 32 p.
(Series: Ita; [Sberniki] v. 59) Errata slip inserted. 5,000
copies printed.

Ed. A.A. Gerasimov, Corresponding Member, USSR Academy of Sciences,
Doctor of Technical Sciences, Professor; Tech. Ed. I.M.A. Dugina;
Exec. Ed. (Ural-Siberian Division, Mashin.); A.V. Kalashina,
Engineer.

PURPOSE: This book is intended for engineering and scientific workers
of institutes and machine-building plants, as well as for students
of advanced courses at vuzes.

COVERAGE: This collection consists of articles dealing with practical
problems in foundry processes. The articles review the achieve-
ments of Ural foundry workers in the past 40 years and present
aspects of a current study on the casting of nodular cast iron,
its properties and casting methods. Description is given of
articles and abstracts on the casting of cast iron and steel in
gray, white, and ductile cast iron, and aluminum. The structure
of cast steel is discussed. A recent investigation of vacuum
casting including its characteristic properties and new applications
is also presented. There are 32 pages of photomicrographs
at the end of the book. No personalities are mentioned. References
follow each article.

TABLE OF CONTENTS:

Березин, Л.А. (Doctor of Technical Sciences), and A.A. Kuznetsov
(Engineer). Cavitation in gray cast iron. 71

The authors investigate, supposedly for the first time, the
form, composition, and heat treatment of graphite in gray cast
iron. -- Factors influencing the cavitation-erosion resistance.
The authors come to the following conclusion: 1) the resis-
tance to cavitation and erosion of gray cast iron is determined
primarily by the form of graphite--nodular cast iron has a signi-
ficantly higher resistance than lamellar graphite cast iron; and
2) the hardness of cast iron does not influence the resistance to
cavitation erosion.

Березин, Л.А. (Engineer), and A.A. Gerasimov. Distribution of sul-
fur in cast iron. 79
The authors point out that in cast iron with lamellar graphite

the dendrite lines are free of sulfur, and that in nodular cast
iron the sulfur is distributed along the dendrite lines.

BOGACHEV, I.N., doktor tekhn.nauk; MINTS, R.I., inzh.

Cavitation-erosion deterioration of gray cast iron. Trudy
Ural.politekh.inst. no.89:71-78 '59. (MIRA 12:8)
(Cast iron--Testing) (Metallography)

18 8300

2558

S/123/61/000/011/003/034
A004/A101

AUTHORS: Bogachev, I. N.; Mints, R. I.

TITLE: Cavitation erosion destruction of ferroc carbon alloys

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 11, 1961, 17, abstract 11A135 (V sb. "Povysheniye iznosostoykosti i sroka sluzhby mashin. v. I", Kiyev, AN UkrSSR, 1960, 36-45)

TEXT: The authors investigated the effect of the chemical and phase composition and the structure of materials on the cavitation erosion durability of steels and gray cast iron on an impact-erosion stand during the multiple collision of the specimens with a water jet at a specimen rotation speed of 78 m/sec and a water pressure of 0.28 atm. The durability was rated by the gravimetric method. The cavitation erosion durability increases up to 0.4% with a rising C-content in steel. None of the mechanical characteristics is a criterion for the rating of the cavitation erosion durability. The cavitation erosion durability is not so much determined by the degree of alloying as by the nature of the obtained structures. The cavitation erosion durability of laminar graphite iron is lower than that of spheroidal graphite iron. The manufacture of cast iron parts

Card 1/2

Cavitation²⁵⁵²⁸
Cavitation²⁵⁵²⁸ erosion destruction ...

S/123/61/000/011/003/034
A004/A101

operating under conditions of considerable cavitation from spheroidal graphite iron (especially alloyed with 1% Ni and 0.28% Mo) leads to a considerable increase in the service life of machine parts.

V. Kolesnik

[Abstracter's note: Complete translation]

Card 2/2

S/129/60/000/06/019/022
E073/E535

AUTHOR: Mints, R. I. Candidate of Technical Sciences

TITLE: All Union Scientific-Technical Seminar on Improving
the Cavitation Resistance of Components, Sverdlovsk

PERIODICAL: Metallovedeniye i termicheskaya obrabotka metallov,
1960, Nr 6, pp 58-60 (USSR)

ABSTRACT: The seminar was held at the initiative of the Problems
Laboratory for Metallurgy at the Ural Polytechnical
Institute imeni S. M. Kirov jointly with other
organizations. In the seminar representatives of
research establishments and works from Sverdlovsk,
Perm', Chelyabinsk, Barnaul, Gor'kiy, Odessa,
Leningrad, Yerevan, Murmansk, Khar'kov and other
places participated. This report gives brief summaries
of the following papers which were read:
G. D. Ter-Akopov, Candidate of Technical Sciences,
"Cavitation failures in hydraulic turbines";
L. I. Ponarskiy, Engineer, "Cavitation in hydraulic
turbines"; M. I. Kurasevich, Engineer, "Cavitation
failures in runners of centrifugal pumps"; Marinin, A.A.,
Engineer, "Cavitation failures in marine propellers"; ✓

Card 1/2

S/129/60/000/06/019/022

E073/E535

All Union Scientific-Technical Seminar on Improving the Cavitation Resistance of Components, Sverdlovsk

N. N. Ivanchenko, Candidate of Technical Sciences, "Cavitation failures in diesel engines"; A.P. Chervyakov, Engineer, "Increase of the cavitation-erosion stability of jacket and cylinder liners of the diesel engines D6 and D12"; I.N. Bogachev, Doctor of Technical Sciences, "Mechanism of the cavitation failure of metallic alloys and principle for the selection of such alloys"; R.I. Mints, Candidate of Technical Sciences, "Combatting cavitation failure by using surface-active additions to the liquid phase of closed systems"; R.Sh. Shklyar, Candidate of Technical Sciences, D.D. Slyusareva, Engineer, and N.N. Syutkin, Engineer, "Structural changes in the initial stages of cavitation failure"; T.M. Petukhova, Engineer, "Influence of the structure on the resistance to cavitation of bronze"; V.V. Havranek, Candidate of Technical Sciences and D.N. Bol'shutkin, Engineer, "Cavitation erosion of metals, thermal and mechanical effects in the cavitation zone".

Card 2/2

3/143/61/000/002/004/006
A207/A126

AUTHORS: Bogachev, I. N., Doctor of Technical Sciences, Professor, Mints, R. I.
Candidate of Technical Sciences

TITLE: On the principle of selection of austenitic steel for parts working
under conditions of cavitation destruction

PERIODICAL: Energetika, no. 2, 1961, 97 - 102

TEXT: The authors had previously conducted a study of the metallographic picture which led to the derivation of laws facilitating the selection of steel gradings for certain conditions. The austenite steels are tentatively divided into two groups differing from each other by the various resistance to plastic deformation. The nature of these steels is judged by the change in the surface hardness at different periods of cavitation action. A study of this action showed that there were various features in the destruction of the austenite, having different composition and nature. These features seem to be connected with the resistance to plastic deformation. The authors give a detailed comparison. There are 4 figures and 6 Soviet-bloc references.

Card 1/2

On the principle of selection of austenitic steel...

S/143/61/006/002/004/006
A207/A126

ASSOCIATION: Ural'skiy politekhnicheskiy institut imeni S. M. Kirova, kafedra
metallovedeniya i termooobrabotki (The Urals Polytechnical Institute
imeni S. M. Kirov, Department of Metal Science and Thermal Processing)

SUBMITTED: January 29, 1960

Card 2/-

89942

S/126/61/011/001/009/019
E111/E452

18 8260

AUTHORS: Bogachev, I.N., Shklyar, R.Sh., Slyusareva, L.D.,
Mints, R.I. and Syutkin, N.N.

TITLE: Change in Structure and Phase Composition of Some
Austenitic Steels in the Initial Stages of Cavitation
Failure

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.11, No.1,
pp.86-93

TEXT: Bogachev and Mints have previously shown that the
resistance to cavitation of austenitic nickel manganese chromium-
nickel and chromium-manganese steels varies greatly (Ref.1). The
object of the present work was to study structural changes during
cavitation failure in the surface layers of the austenitic steels
of the following types and compositions (%):

	<u>C</u>	<u>Ni</u>	<u>Mn</u>	<u>Cr</u>
1Kh18N8 1X18H8	0.12	8.39	0.92	18.05
30G10Kh9 30Г10Х9	0.31	0.13	10.30	9.117
40N25 40Н 25	0.40	25.00	0.20	0.13
80G14 80Г14	0.81	1.10	14.50	0.40

Card 1/5, 16

89942

S/126/61/011/001/009/019
E111/E452

Change in Structure and Phase Composition of Some Austenitic Steels
in the Initial Stages of Cavitation Failure

Specimens were plunged in water after holding for 30 minutes at 1050°C. After removal of the outer layers, specimens were subjected to the cavitation action of a magnetostriction vibrator for 5, 10, 15 and more minutes. Phase composition changes were qualitatively determined from X-ray patterns obtained from a polished section. Structural changes were determined from interference-line width and also changes in shape and dimensions of individual spots. The back-reflection camera provided three images of the same interference ring on one film at different specimen-film distances. Spot dimensions were measured on all rings in tangential and radial directions with the aid of a type W3A-2 (IZA-2) comparator. Patterns were obtained from the same part of a given specimen after various treatments. Line width was measured on patterns obtained separately in chromium radiation with rotation of both specimen and film. Two of the steels were also studied electron-microscopically before and after testing for 5 and 10 minutes. The work showed that the austenite lines obtained exclusively from all specimens before testing were

Card 2/5
4

S/126/61/011/001/009/019
E111/E452

Change in Structure and Phase Composition of Some Austenitic Steels
in the Initial Stages of Cavitation Failure

supplemented in three of the steels by other lines after testing. The transformation of austenite was different in two steels: in type 1X18W8 (1Kh18N8) the alpha-phase was formed; in type 30F10X9 (30G10Kh9) epsilon-phase was formed as well. This was confirmed in the electron photomicrographs. In type 40W25 (40N25) steel the transformation was similar to that in 1Kh18N8 but slower, while in 80F14 (80G14) only austenite lines were found even after prolonged specimen treatment. Interference spots generally survived specimen treatment and spot changes were similar in all four steels. The situation is qualitatively represented by the authors in terms of changes in the disorientation angle for individual crystals. In Fig.5, this angle (minutes) is plotted against treatment time (minutes) for various crystals of 40N25 (plot "a") and 80G14 (plot "b") steels. For all the steels the width of the $(311)_\beta$ line increased in the first stages of treatment and then became steady. From the photometric curve of the $(311)_\beta$ line dimensions of mosaic blocks and II type disturbances were found (as in Ref.2): in the first Card 3/5

6742

S/126/61/011/001/009/019
E111/E452

Change in Structure and Phase Composition of Some Austenitic Steels
in the Initial Stages of Cavitation Failure X

few minutes the former decrease rapidly and the latter increase;
the intensity of these effects being different for the different
steels. The authors conclude that resistance to cavitation
disruption rises when tetragonal martensite, epsilon phase and
fine carbides are liberated within the austenite grain;
resistance falls when alpha-phase (low in carbon) is liberated
either within or around the grain. There are 7 figures, 2 tables
and 3 Soviet references.

ASSOCIATION: Ural'skiy politekhnicheskii institut im. S.M.Kirova
(Ural Polytechnical Institute imeni S.M.Kirov)

SUBMITTED: April 4, 1960

Card 4/5

21362

S/126/61/011/004/009/023
E021/E435

18.1285 1454, 1555, 2808

AUTHORS: Bogachev, I.N., Mints, R.I., Petukhova, T.M. and D'yakova, M.A.

TITLE: The Influence of Phase Composition and Structure on the Cavitation Stability of Titanium and its Alloys

PERIODICAL: Fizika metallov i metallovedeniye, 1961, Vol.11, No.4, pp.557-563

TEXT: Testing was carried out on an erosion stand with a circumferential speed of rotation of the samples of 78 m/sec, a constant pressure of water 0.28 atm, diameter of jet 8 mm and distance 1.8 cm. The cavitation stability was evaluated by the loss in weight every 5 hours of testing. Alloys with α -phase structure (commercial Ti type BT1A (VT1D), Ti-3.5 Al, Ti-2.5 Al-5Sn, Ti-6Al-4V) showed slip lines and twins in the initial stages. With increase in time, cracks developed along the twins, the slip lines and along the grain boundaries. Table 1 shows the influence of alloying on the stability of α alloys. Solid solutions of the β phase (Ti - 3.25 Al - 10.45 Cr - 7.95 Mo - 0.11 Fe and Ti - 9.6 V - 2.84 Al - 3.8 Mn) showed some disintegration simultaneously in the grain boundaries and in the grains (Fig.2).
Card 1/8

21362

S/126/61/011/004/009/023
E021/E435

The Influence of Phase ...

Although the β solid solutions were more resistant to cavitation than the α , they were liable to sudden fracture and were unsuitable for use in such conditions. Alloys with a martensitic structure were also tested. The martensitic structure was produced by fast cooling from the β region. During testing the α phase was destroyed more uniformly than the α phase. Disintegration began at the grain boundaries and in the grains at the boundaries of the martensitic needles. Fig.1 shows the initial stages of cavitation of the α and α' -phases. The martensitic structure has a high resistance to cavitation as shown by Fig.2, where the loss in weight (mg) is plotted against the time of testing (hours) for the α , α' , $\alpha + \alpha'$ and $\alpha + \beta$ phases of the same alloy. The presence of a fine acicular martensitic structure leads to increase in the cavitation stability. The resistance to cavitation of an alloy consisting of $\alpha + \beta$ was intermediate between the resistance of α and α' . Disintegration began at the boundaries of the two phases and developed in the phase which was less stable towards cavitation. A mixture of β and ω phases was obtained by heat treatment of the Ti - 9.6 V - 2.84 Al - 3.8 Mn alloy. The formation of the ω phase

Card 2/8

21362

S/126/61/011/004/009/023
E021/E435

The Influence of Phase ...

led to an increase in hardness from 360 to 495 kg/mm². Cavitation caused a network of slip lines as in the case of the β phase. The resistance to cavitation of the $\beta + \omega$ alloy was higher than that of the β alloy, but it was liable to sudden fracture as was the β alloy. Thus the cavitation stability of titanium alloys depends on the structure and phase composition and not on the mechanical properties. There are 4 figures, 2 tables and 2 references: 1 Soviet and 1 non-Soviet.

ASSOCIATION: Ural'skiy politekhnicheskii institut im. S.M.Kirova
(Ural Polytechnical Institute imeni S.M.Kirov)

SUBMITTED: July 30, 1960

Card 3/8

188360

32546

S/128/62/000/001/002/002
AC04/A127

AUTHORS. Bogachev, I.N.; Mints, R.I.

TITLE Cavitation resistance of cast austenitic steels

PERIODICAL. Liteynoye proizvodstvo, no 1, 1962, 30 - 32

TEXT. The authors report on tests carried out to study the cavitation resistance of various steel grades. The tests were carried out on an impact-erosion stand. The specimen rotation speed was 78 m/sec, the constant water pressure being 0.28 atm. The nozzle outlet bore was 8 mm in diameter, while distance $d = 1.4$ cm. The authors point out that corrosion resistance is only one pre-requisite of parts operating under cavitation effect. To ensure a high cavitation resistance, the steel should possess a high resistance to micro-impact action, its structure should represent a homogeneous solid solution. Ferrite possesses the lowest cavitation resistance, while martensite is most cavitation-resistant. Based on the tests, the 30X10G10 (30Kh10G10) non-nickel austenitic steel has been developed. Steels of this type were investigated having the following composition: 0.28 - 0.44% C; 7 - 10.6% Mn; 9.6 - 12% Cr; 0.34 - 0.57% Si; 0.011 - 0.041% S; and 0.01 - 0.032% P. The authors show the effect

Card 1/2

32546

S/122/62/001/01/02/02

A004/A127

Cavitation resistance of cast austenitic steels

The austenitic nature of the steel on the cavitation resistance by an example and point out that the 30Kh10G10 grade steel ensures a more intensive hardening of the surface layer than the 1X18H8 (1Kh18N8) grade steel. It is stated that, generally, the less stable chrome-manganese austenite has a higher cavitation resistance, since it is subjected to self-hardening during the cavitation process owing to the austenite decomposition and the formation of martensite and the θ -phase. The test results show that, in choosing cavitation-resistant steels, preference should be given to stainless, austenitic alloys with an unstable structure, which are hardened not only by the plastic deformation of the initial structure, but by phase transformation. Tables show the mechanical properties of such steels after austempering heat treatment, depending on the deformation temperature and the effect of the deformation rate on the mechanical properties of steel with 0.28% C, 0.8% Mn and 10.9% Cr. The higher the heating temperature and the time of isothermal holding, the greater is the formation of the α -phase and carbides. A table shows the cavitation resistance of 30Kh10G10 grade steel in comparison with other grades mainly used in the construction of hydraulic machines. There are 4 figures, 2 tables and 8 references.

Card 2/2

S/114/62/000/004/005/008
E114/E554

181150

AUTHORS: Bogachev, I.N., Doctor of Technical Sciences,
Professor and Mints, R.I., Candidate of Technical
Sciences

TITLE: Principles underlying the choice of steel for
hydraulic turbines

PERIODICAL: Energomashinostroyeniye, no.4, 1961, 27-30

TEXT: Certain steels with good anti-corrosive properties,
such as 18-8 chrome-nickel stainless steel are, nevertheless,
easily damaged by cavitation. The article relates the results
of microscopic investigations of the relationship between the
structure of metal and its resistance to cavitation, which lead
to the conclusion that in addition to having good anti-corrosive
properties, the suitable steel should withstand well the micro-
impulsive forces. Therefore such steel will be a homogeneous
solid solution. The least resistance to cavitation is offered
by ferritic steels and the great by martensite. The most
suitable steels are austenitic, which, in the process of deforma-
tion, have the property of self-hardening by the conversion of
Card 1/3

Principles underlying the ...

3/12/62/000/000/000/000
2114/E954

some of the austenitic structures into martensite. For example, the unstable austenitic steel containing at least 0.3-0.4% carbon forms martensite along the lines of deformation when subjected to micro-impulsive forces and is, therefore, well resistant to cavitation. It is necessary to choose the ratio between the carbon content and the content of the alloying elements in the austenitic steel such that martensite should not begin to form too early. Based on the foregoing, a new austenitic steel designated 30X10G10 (30Kh10G10) was developed containing about 0.3% carbon, and equal quantities of chrome and manganese. This steel is less stable than 12-8 chrome-nickel steel and it therefore has greater self-hardening properties. Instead of wearing by pitting and by growth of individual pits, the new steel wears uniformly over the whole surface. To withstand cavitation, the steel should not only deform plastically under austenite should decompose with the formation of martensite. The exact chemical analysis of the 30Kh10G10 steel is 0.28-0.32% C, 9-10% Cr, 9-10% Mn, 0.3-0.5% Si, 0.02-0.03% P, 0.03-0.04% S.

Card 2/3

Principles underlying the ...

S/114/62/000/004/005/008
E114/E554

After quenching in water or air from 1100°C, the steel assumed austenitic structure. Mechanical properties are given and resistance to cavitation is shown in tabular form to compare well with other steels. The new steel can be used in the form of castings, sheet and welding material. There are 5 figures and 3 tables.

X

Card 3/3

BOGACHEV, I.N., doktor tekhn.nauk, prof.; MINTS, R.I., kand.tekhn.nauk;
PETUKHOVA, T.M., inzh.

Effect of phase constitution on the cavitation resistance of bronze.
Metalloved.i term.obr.met. no.4:28-31 Ap '62. (MIRA 15:4)

1. Ural'skiy politekhnicheskii institut.
(Bronze—Metallography) (Phase rule and equilibrium)
(Cavitation)

S/125/62/000/007/008/012
D040/D113

AUTHORS: Khomus'ko, F.A., and Mints, R.I.

TITLE: The development of a cavitationproof surfacing method

PERIODICAL: Avtomaticheskaya svarka, no. 7, 1962, 81-87

TEXT: The method consists in surfacing plain steel with austenitic nickel-free 30X10G10 (30Kh10G10) steel highly resistant to cavitation. This new steel was developed by I.N. Bogachev and Mints in order to find a steel resistant to the mechanical effect of microimpact; it proved to be the best of all other grades tried in experiments. Experimental surfacing consisted in depositing various steels on plates of C7.3 (St.3) steel by submerged-arc d.c. welding with reverse polarity, using cold-rolled or cast electrode tape, or powder wire and pumiceous AN-26 (AN-26) flux. Heat-treated 30Kh10G10 specimens last only 5 mg weight in 6 hours in impact-erosion tests, compared to 377, 440 and 610 mg, using 3 other steels; 30Kh10G10 coatings had 7-8 times better cavitation resistance than coatings of other types of metal used for water turbines. 30Kh10G10 coatings with 200 HB resisted cavitation better than 4X13(4Kh13) coatings with 540 HB; the latter have to be quenched, and it is difficult to do this with complex parts, such as turbine blades. The optimum

Card 1/3

S/125/62/000/007/008/012
 DC40/D113

The development of a

composition for the tape electrode is 0.34% C, 12.16% Mn, 0.31% Si, and 14.00% Cr. The Institut elektrosvarki im. Ye.O. Patona (Electric Welding Institute im. Ye.O. Paton) and the TsKTB of the Odesskiy sovmarkhoz (Odessa Sovmarkhoz) succeeded in producing electrode tape by continuous rolling from liquid metal, and tested the tape in laboratory experiments with pumiceous AN-26, ~~AH-26~~ (AN-26) and ~~AH-60~~ (AN-60) fluxes. Well shaped beads were obtained with 750-800 amp, 28-30 v arc, and 9 m/hr welding speed, and the AN-26 flux proved to be the best. Conclusions: (1) 30Kh10G10 coatings have sufficiently high mechanical and satisfactory technological properties; the steel may be used for bimetal parts operating under conditions promoting cavitation; (2) automatic surfacing technology has been developed; (3) the 30Kh10G10 steel has a high cavitation resistance and ought to be used widely in hydraulic machinery. The life of water turbine blades can be greatly extended by surfacing with this steel, and nickel can be saved. There are 7 figures and 6 tables.

Card 2/3

S/125/62/000/007/008/012
D040/D113

The development of a

ASSOCIATION: Ordona Trudovogo Krasnogo Znaniya Institut elektrosvarki im.
Ye.O. Patona AN USSR (Electric Welding Institute "Order of the Red
Banner of Labor" im. Ye.O. Paton, AS UkrSSR) (F.A. Khomus'ko);
Ural'skiy politekhnicheskiy institut im. S.M. Kirova (Ural Poly-
technic Institute im. S.M. Kirov) (R I Mints)

SUBMITTED: February 9, 1962

Card 3/3

S/126/62/013/003/006/023
E111/E435

18.11.1

AUTHORS: Mints, R.I., Gorbach, V.G.

TITLE: Influence of phase work hardening on the durability of austenitic steels under the influence of micro impacts

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.3, 1962, 365-370

TEXT: Micro impact produces localization of the individual act of deformation in a volume commensurate with the size of the grain and its boundaries or with that of the separate structural components. In the present work the authors have studied the durability of the following steels under micro impact during cavitation.

Fe: 28.7% Ni, 0.05% C;

Fe: 20.5% Ni, 2.22% Cr, 0.6% C, 0.45% Mn, 0.50% Si;

Fe: 18.0% Ni, 2.08% Cr, 2.07% Si, 0.38% C, 0.47% Mn;

Fe: 30.0% Ni, 0.87% Be, 0.05% C.

To effect recrystallization of austenite and standardize grain size in all the alloys, the billets were heat treated and then

Card 1/3

S/126/62/013/003/006/023
E111/E435

Influence of phase work ...

subjected to one cycle of phase work hardening by cooling in liquid nitrogen after hardening and slowly heating to the temperature of the reverse martensite transformation. Specimens were machined from the billets for mechanical tests, the micro impacts were produced hydraulically in an impact-erosion test machine, the specimens were rotated at 78 m/sec and the relative durability was estimated by the weight-loss method (average for 4 specimens). The results show that phase work hardening of high-nickel austenitic alloys increases their durability under micro impact conditions by a factor of 10 to 12. Their durability nevertheless remains on the level of type 1X18H8 (1Kh18N8) steel. Phase work hardening also affects all mechanical properties; tensile strength and yield point, hardness etc increase 2 to 3-fold reaching levels equal or higher than those for type 30X10Г10 (30Kh10G10) steel. However, because the austenite solid solution is iron-nickel, the resistance to micro impacts will remain below that of the steel 30Kh10G10, in spite of the high mechanical properties. The authors conclude that the nature of the austenite solid solution has a decisive effect on

Card 2/3

Influence of phase work ...

S/126/62/013/003/006/023
E111/E435

the resistance to micro impact. There are 5 figures and
5 tables.

ASSOCIATIONS: Ural'skiy politekhnicheskiy institut im. S.M.Kirova
(Ural Polytechnical Institute imeni S.M.Kirov)
Institut fiziki metallov AN SSSR
(Institute of Physics of Metals AS USSR)

SUBMITTED: June 24, 1961

Card 3/3

S/126/62/013/003/010/023
E111/E435

18.1100

AUTHORS: Mints, R.I., Bogachev, I.N.

TITLE: Hardening of solid solutions based on iron during local loading

PERIODICAL: Fizika metallov i metallovedeniye, v.13, no.3, 1962, 399-405

TEXT: It is known that under the given conditions, phase and structural changes greatly affect the resistance of austenitic alloys to concentrated impact and micro impact loading. In the present investigation, hardening during local static and impact loading of austenite, ferrite, martensite and ϵ -phase was studied. The range of compositions covered, in addition to armco iron, was: 0.03 to 0.38% C, traces to 37.8% Mn, traces to 0.27% Cr, traces to 36.4% Ni, 0.17 to 0.58% Si, 0.01 to 0.17% P, 0.007 to 0.030% S. Local static loading was carried out on a Brinell test machine (sphere diameter 5 mm, load 750 kg). Concentrated impact was delivered by a 6 kg weight sharpened to 60° falling through a height of 0.5 m. Micro impact was obtained by means of a hydraulic micro-erosion test stand

Card 1/3

Hardening of solid solutions ...

S/126/62/013/003/010/023
E111/E435

(specimen revolved at a velocity of 78 m/sec, jet pressure 0.28 atm, nozzle diameter 5 mm). After annealing and water quenching (to obtain the required range of phases) the specimens were tested. Hardening was studied by microhardness measurements on metallographic polished sections. It was found that all the solid solutions are only slightly and similarly hardened by local static loading but, under local impact and micro impact loading, show a considerable and different tendency to hardening. The low-carbon austenitic nickel and manganese alloys showed this effect; the differences are due to the nature of the plastic deformation and of the solid solution (i.e. nickel or manganese austenite). The martensite and ϵ -phase formed in the course of plastic deformation can harden spontaneously which leads to general hardening of the corresponding alloys. The formation of ϵ -phase as a result of solid-solution decomposition during plastic deformation, brought about by local impact and micro impact loading, produces greater hardening of the alloy than when ϵ -phase is formed through heat treatment. The hardening of alloys by plastic deformation is due to the plastic deformation of

Card 2/3

Hardening of solid solutions ...

S/126/62/013/003/010/023
E111/E435

the solid solution, phase changes during the decomposition of the solid solution and hardening of the new phase formed as a result of this decomposition. The extent to which each factor contributes to the general ability of the alloy to harden depends on the nature of the solid solution and loading. There are 8 figures and 1 table.

ASSOCIATION: Ural'skiy politekhnicheskiy institut im. S.M.Kirova
(Ural Polytechnical Institute imeni S.M.Kirov)

SUBMITTED: March 17, 1961 (initially)
October 25, 1961 (after revision)

Card 3/3

X

8/126/62/014/006/002/020
E111/E151

AUTHORS: Mintz, R.I., and Gorbach, V.G.

TITLE: Influence of nickel on the resistance of austenitic steels to cavitation

PERIODICAL: Fizika metallov i metallovedeniye, v.14, no.6, 1962, 814-819

TEXT: Nickel austenite has a low resistance to micro-impact; it depends on composition and is not improved by various forms of treatment. The effect of nickel is linked with both the stability of the austenite and the nature of the plastic deformation of the sub-grains. The object of the present work was to study the influence of these factors on the stability and strengthening of austenitic steels under micro-impact. The range of compositions tested was (%): 0.28-0.87 C; 0.6-30.0 Mn; 2.25-12.6 Cr; 0.04-21.0 Ni; the martensite-point values ranged from -20 to -190 °C. The steels fall into two groups: 1) those nominally unstable, with martensite points above -70 °C; 2) those nominally stable with martensite points -90 °C and below. There is a correlation between the micro-impact resistance and the martensite-
Card 1/2

Influence of nickel on the ...

5/126/62/014/006/002/020
E111/E151

point value only for steels within the same group, but not between those in different groups, those unstable having the higher resistance. The position of the martensite point alone is an insufficient indication of the impact resistance. The important factor is the nature of the alloy solid solution. In general the stability and strengthening of manganese and chromium-manganese steels is superior to that of nickel and chromium-nickel steels, irrespective of the position of the martensite point. There are 7 figures and 1 table.

ASSOCIATION: Ural'skiy politekhnicheskii institut im. S.M. Kirova
(Ural Polytechnical Institute imeni S.M. Kirov),

Institut fiziki metallov AN SSSR
(Institute of Physics of Metals, AS USSR)

SUBMITTED: May 14, 1962

Card 2/2

BOGACHEV, I.N., doktor tekhn. nauk; MINIS. R.I., kand. tekhn. nauk

Increasing the cavitation resistance of machine parts by
the use of surface-active agents. Izv. vys. ucheb. zav.;
mashinostr. no.2:224-230 '65. (MIRA 16:P)

1. Ural'skiy politekhnicheskii institut.

L 9979-63 EMP(g)/EWT(m)/BDS--AFFIC/ASU--JD/EM-2
 ACCESSION NR: AF3001051 5/01/63/000/004/0104/0108

AUTHOR: Litvinov, V. S.; Mints, R. I.

TITLE: Strain hardening of austenitic manganese and nickel alloys

SOURCE: IVUZ. Chernaya metallurgiya, no. 4, 1963, 104-105

TOPIC TAGS: strain hardening, manganese austenitic steels, nickel austenitic steels, static loads, dynamic loads, microimpact

TEXT: A study has been made of the strain-hardening behavior of two low-carbon austenitic steels, 038 (0.03% C, 38.0% Mn) and N36 (0.05% C, 34.7% Ni), under static and dynamic loads. The static loads were applied by a standard tensile test or (locally) by pressing a 5.5-mm-diameter ball to a depth of 2.5 mm. A local dynamic load was applied by dropping a 20-kg weight onto the same ball from a height of 0.5 m. A rapid-impact load was applied by firing a pin at a velocity of 790 to 800 m/sec, sufficient to pierce the specimen. For the microimpact test, a hydraulic-erosion

Card 1/3

L 9979-63

ACCESSION NR: AP3001051

machine was used, with a water pressure of 0.28 atm. Under all types of loads, G38 showed greater strain hardening. In the static tensile test, necking down and fracture occurred in N36 at elongation of 25% and 36%, respectively, and in G38, at 31% and 39%. Local loading increased the hardness of G38 by as much as 170 H sub B (static) and 210 H sub B (dynamic); for N36 the respective figures were 95 and 100 H sub B. Locally loaded specimens of G38 were strain hardened through the entire thickness, but those of N36, only to a depth of 3 to 3.5 mm. Local loads produced maximum strain hardening precisely at the surface. In the case of rapid-impact loading, the increase in hardness in the immediate vicinity of the pierced hole was 250 H sub B in the case of G38 and 100 H sub B for N36. Although, under conditions of microimpact, these steels are not erosion resistant, considerable strengthening takes place, more intensively in G38 than in N36, the difference being greater at the surface. Metallographic examination of N36 specimens after microimpact revealed a displacement of individual grains, viscous intragranular microflow near the grain boundaries, and wavy traces of plastic deformation, whereas in G38 the deformation was not localized in the boundary zones, being more uniform, as indicated by straight slip lines. It is concluded that the difference in the strain-hardening behavior of these steels cannot be

Card 2/3

L 9979-63

ACCESSION NR: AP3001051

explained solely on the basis of phase transformations under the effect of plastic deformation, but rather by the intrinsic qualities of the solid solution, i.e., the type of alloying. Orig. art. has: 6 figures.

ASSOCIATION: Ural'skiy politekhnicheskiy institut (Ural Polytechnic Institute)

SUBMITTED: 08Jun62 DATE ACQ: 11Jun63

ENCL: 00

SUB CODE: 00 NO REF SOV: 001

OTHER: 002

ph/qm

Card 3/3

BOGACHEV, I.N.; MLITS, R.I.; Prinsipala uchashtiye PETKOVA, S.N.

Effect of treatment in fused media on the plasticity of trans-
former steel. Izv. vys. i. reb. zav.; Chern. met. 6 n. 1:174-176
'63. (MIRA 16:11)

1. Ural'skiy polit. i. ekonom. institut.

BOGACHEV, I.N., doktor tekhn.nauk, prof.; MINES, R.I., kand.tekhn.nauk;
VEKSLER, Yu.G.

Cavitation resistance of austenitic ferrite steel.
Energomashinostroenie 9 no.9:29-31 S '63.

(MIRA 10:10)

L 18103-63

EWP(q)/EWT(m)/BDS

AFFTC/ASD

Pod

JD/HW

S/0126/63/015/006/0860/0866

ACCESSION NR: AP3002844

AUTHORS: Chumakova, L. D.; Bogachev, I. N.; Shklyar, R. Sh; Mints, R. I.

TITLE: Phasal and structural changes in the surface layer of austenite alloys at the initial stage of the cavitation effect

SOURCE: Fizika metallov i metallovedeniye, v. 15, no. 6, 1963, 860-866

TOPIC TAGS: cavitation effect, austenite alloy, Ni, Mn, phasal change, structural change

ABSTRACT: Structural changes in the surface layer of austenitic Ni and Mn alloys subjected to minute impacts were studied by x-rays. It was established that the cavitation effect results in the increase of submicroscopic nonhomogeneity of intragranular structure and in a partial decomposition of austenite. Depending on their chemical composition, the manganese samples showed a partial decomposition of austenite and the formation of ϵ -phase or of ϵ -phase and martensite. The Ni samples showed decomposition of a small amount of austenite and the formation of martensite. The conversions $\gamma \rightleftharpoons \epsilon$ in the G30 alloy and $\gamma \rightleftharpoons \epsilon \rightarrow \alpha$.

Card 1/2

L 18103-63

ACCESSION NR: AP3002844

3
16
in the 40G14 steel harden the alloys and increase their resistance to cavitation destruction. The high resistance of the stable manganese austenite 40G30 to the impacts proves that phase transformations are not the only factors determining the high stability of alloys with respect to the cavitation effect. Orig. art. has: 1 table, 3 graphs, and 2 photographs.

ASSOCIATION: Ural'skiy politekhnicheskii institut im. S. M. Kirova (Ural Polytechnic Institute)

SUBMITTED: 31Oct62

DATE ACQ: 23Jul63

ENCL: 00

SUB CODE: ML

NO REF SOV: 005

OTHER: 001

Card 2/2

BOGACHEV, I.N.; LITVINOV, V.S.; MINTS, R.I.

Characteristics of the plastic deformation of austenitic manganese
and nickel alloys. Fiz. met. i metalloved. 16 no.4:596-602 0
'63. (MIRA 16:12)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova.

RATIKOV, M.I., kand. techn. nauk; MILIT, B.I., kand. techn. nauk

Technological and characteristics of welding at high frequency of
cavitation-resistant 30Kh19G10 steel. (Var. 1-12V, no. 11-12
51 '6..)

L. Tral'skiy politekhnicheskii institut.

17392-65 EWI(m)/EWA(d)/I/EWP(t)/EWP(b) LJP(c)/AEDC(a)/ASD(m)-3/ASD(f)-2/
 ASD(p)-3 JD/MB/MLK
 CE: ON NR AMLO 6710 BOOK EXPLOITATION 8/ 8+1

Rogachev, I. N.; Mints, R. I.

Improving the cavitation-erosion resistance in machine parts (Povysheniye kavitatsionno-erozionnoy stoykosti detaley mashin), Moscow, Izd-vo "Mashinostroyeniye", 1964, 142 p. illus., biblio. 3,800 copies printed.

TOPIC TAGS: metallography, cavitation, austenitic steel, copper alloy, surface activity, chromansil steel

PURPOSE AND COVERAGE: This book is devoted to the metallography of cavitation failure of ferrous and nonferrous alloys. It considers problems related to selection of alloy compositions that are resistant to cavitation-erosion failure. On the basis of established laws, the ways of improving the cavitation-erosion resistance of metals are shown. The book is intended for technical and scientific workers -- metallurgists, heat treaters, and designers.

TABLE OF CONTENTS [abridged]:

Introduction -- 3

Card 1/2

L 17592-65

ACCESSION NR AM 046710

0

- Ch. I. Cavitation -- a particular instance of micro-impact failure -- 5
- Ch. II. Failure of austenite in micro-impact loading -- 29
- Ch. III. Improving the cavitation resistance of steels -- 74
- Ch. IV. Improving the cavitation resistance of nonferrous alloys -- 99
- Ch. V. Improving the cavitation resistance of a metal by changing the properties of the liquid -- 117
- Ch. VI. Micro-impact failure in a gaseous medium -- 133
- Bibliography -- 141

SUB CODE: MM

SUBMITTED: 25Feb64

NR REF SOV: 043

OTHER: 015

Card 2/2

L 17618-65 EWT(m)/EWA(d)/EWP(t)/EWP(b) MJW/JD/WB/JXT(CZ)

ACCESSION NR: AP4044119

5/0148/64/000/008/0123/0128

AUTHOR: Mints, R. I.; Gorbach, V. G.; Eysmond, T. D.

TITLE: Kinetics of martensite formation in chromium-nickel and chromium-manganese steels under the effect of deformation

SOURCE: IVUZ. Chernaya metallurgiya, no. 8, 1964, 123-128

TOPIC TAGS: chromium nickel austenitic steel, 44Kh10g7 steel cavitation resistance, 70Kh7N8 steel cavitation resistance, chromium manganese austenitic steel, deformation induced martensitic transformation, steel cavitation resistance

ABSTRACT: The study of martensitic transformation in 70Kh7N8 and 44Kh10g7 austenitic steels has shown that while both steel types have the same M_s temperature, -20 to -60C, and form the same amount of martensite on cooling, they differ sharply in the intensity and volume of martensitic transformation under the effect of deformation. The intensity of martensite formation and the quantity of the martensite is much higher and the transformation temperature range is

Card 1/3

* Should be 44Kh10G7

L 17618-65

ACCESSION NR: AP4044119

wider in chromium-manganese steel than in chromium-nickel steel since the M_d point of the formula, i.e., 180-200C, is higher than that of the latter, i.e., 140C. With an increasing reduction and a decreasing deformation temperature, the quantity of martensite found in chromium-manganese steel increases much more rapidly than in chromium-nickel steel. Rolled at 200C both steels have the same hardness, but the hardness of chromium-manganese steel increases more rapidly with a decreasing temperature of deformation than the hardness of chromium-nickel steel. This can be explained by lower stability of chromium-manganese austenite in the process of plastic deformation. Under conditions of cavitation when the plastic deformation occurs in microelements, a continuous martensite layer may be formed in chromium-manganese steel, while in chromium-nickel steel a maximum deformation yields only an insignificant quantity of martensite. Orig. art. has: 6 figures.

ASSOCIATION: none

Card 2/3